

Work Order ID 77763

77763

Page 1

December 21 11 9:28:03 AM

Item ID: D350-748-101

Accept

N900040100

Setup Start *NS1*

Revision ID: U/R

Item Name: Crosstube Installation, High Fwd

Stop *NS2*

Start Date: 21/12/2011 Start Qty: 1.00

1



Cust Item ID:

Required Date: 13/01/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: M.L.S Date: 11/12/21

Tooling:

Date:

Run - Start *NR1*

QC: Date:

Date:

SPC (Y/N):

Date:

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D350-748-141	FUR OK P12.04.19								
100		0.00							
100	DOCUMENT CONTROL								
DC	Memo	0.00							
Document Control	Photocopy bluefile & type labels per PPPD350-748-101		CHG002						
110		0.00							
110	BENDING MACHINE - CROSSTUBES								
CNC Bend 1	Memo	0.00							
CNC Delta 100 Bender	Bend tube as per Dwg D350-748-141 using CNC bender program D350F and Folio FT								
120		0.00							
120	QC15- Crosstube Dimensional Check								
QC	Memo	0.00							
Quality Control									

①

12-05-23

ML5 12-5-23

①

SAD 12-04-03

CP 12.04.11

①

7/10 ->

W/O: 77763

WORK ORDER CHANGES

DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng/ Prod Mgr	Approval QC Inspector

Part No: D350-748-101 PAR #: _____ Fault Category: X-tube NCR: Yes No DQA: OK Date: 12/06/16
 Resolution: Rework Disposition: Rework QA: N/C Closed: OK Date: 12/06/18

NCR: 12-1510

WORK ORDER NON-CONFORMANCE (NCR)

DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
12.01.11	110	tube bent high + narrow	CP 12.01.11 PS1642	- Cut to 23.40" high. - Acceptable	MO 12-4-18	RM 12-4-18	CP 12.04.11 PS1642	N 12.04/18
12/04/12	# 100	Four c/s to be cutters Ras. From 0.060" to 0.100" R.C. Heat treat method	CP 12.04.19 PS1642	Rework as per attached email original cuss min 2.205" max 2.282" after rework min 2.235" max 2.243"	PS 12.04/18	W 12.04/18	CP 12.04.19 PS1642	S 12/04/17

NOTE: Date & initial all entries

Work Order ID 77763***77763***

Page 2

December-21-11 9:28:03 AM

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Revision ID: U/R

Stop ***NS2***

Item Name: Crosstube Installation, High Fwd

Start Date: 21/12/2011 Start Qty: 1.00

1

Cust Item ID:

Required Date: 13/01/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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125

0.00

125

HandFXtube

Purch.

Memo

0.00

Hand Finishing Crosstubes

Stress relief

Heat treat crosstube as per QSI010 4.3

Temp: _____

Start time: _____

Finish time: _____

*Issue P/O to Metcon**P/O: 16638**Per DEO D350-748-141 F-1**CY 12/09/104 ①*

127

QC6- Inspect dimensions to drawing

0.00

127

QC

Memo

0.00

Quality Control

CP 12.04.11 ①

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 77763

December-21-11 9:28:03 AM

77763

Page 3

Item ID: D350-748-101

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N9000040100

Setup Start

NS1

Revision ID: U/R

Stop

NS2

Item Name: Crosstube Installation, High Fwd

Start Date: 21/12/2011 Start Qty: 1.00

1

Cust Item ID:

Required Date: 13/01/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan: _____

Date: _____

Tooling: _____

Date: _____

Run Start

NR1

QC: _____

Date: _____

SPC (Y/N): _____

Date: _____

Stop

NR2Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

130

0.00

130

Crosstubes

Crosstubes

Memo

0.00

Crosstubes

1-Drill Tube as per Dwg D350-748-141 Using DT8876 A,B &C Drill Jigs,
Set-up drill table as per QSI 010

2-Deburr

3-Engrave Part # and Batch # as per Dwg D350-748-141

4-Remove all marks from tube within limits of D350-748-141

5- Apply a light coat of LPS3 on the interior of tube

Batch: W/AS

140

QC5- Inspect part completeness to step on W/O

0.00

140

QC

Memo

0.00

Quality Control

CHECK 10 DEG HOLES WITH DT8876E (EUROCOPTER CLAMP)

TW

12-04-23

MO

12-4-23

Scribbles

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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December-21-11 9:28:03 AM

77763

Page 4

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N900040100

Setup Start ***NS1***

Revision ID: U/R

Stop ***NS2***

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Start Date: 21/12/2011 Start Qty: 1.00

1

Cust Item ID:

Required Date: 13/01/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

150 Outsource process-Cadplate per QSI017 4.1.9.1 0.00

150

Outsource3

Outsource process - Cad plate

Memo

0.00

Issue P/O: 16826

Stress relief at 375° for 5 hours

Magnetic Particle Inspect per ASTM E1444

Cadium Plate per AMS-QQ-P-416B, Class 1, Type 2

Embrittle relief at 375° for 8 hours, Chromate Treat

Possible Supplier: Southwest United Industries

Ensure Certificate of Conformity is attached

CH 12/04/25 (1)

160 Receive & Inspect for Damage & Mat'l Certs 0.00

160

Packaging

Memo

0.00

Packaging

Ensure certificate of conformity is attached

170 QC5- Inspect part completeness to step on W/O 0.00

170

QC

Memo

0.00

Quality Control

★ SEE W/O CHG ATTACHED
WH 12-05-22

12/4/22 (1)
12/4/15 (1)
12/4/17 (1)

POSITIVE RECALL

EFFECTIVE 12-04-19 AUTH RP

RELEASED UP DATE 12-05-15

FOR LOAD TEST

purchase: issue P/O to acumen P/O: 17031 CH 12/05/22

rec'd. rec'd + inspect attached. COFC to W/O 1

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

W/O: 77763

Rem CHG

WORK ORDER CHANGES

DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
11.10.05	161	LOAD TUBE TO 3500 ^{lb} FOR 1 MINUTE. REF D.S. EMAIL.	PA	CP 12.05.15	1	CP 12.05.15 DS1042	
11.10.05	162	NDT TUBE. P/O 17031	PA	W1 12.05.15		CP 12.05.15 DS1042	

Part No: D350-748-101 PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Chris Provencal

From: David Shepherd <dshepherd@dartaero.com>
Sent: Tuesday, April 27, 2010 3:40 PM
To: 'Mike Petsche'
Cc: 'Bill Beckett'; 'L Lacelle'; 'Chris Provencal'; 'Dan Stow'; ssheldon@dartaero.com
Subject: 350 crosstubes

Mike,

I discussed the 350 crosstube load testing with Bill a little while ago and this plan makes sense to him.

So, my recommendation to clear these crosstubes is to load the fwd crosstubes to 3500 lb and the aft crosstubes to 3000 lb in the deflection test rig and document on the work orders that this test has been completed. Hold max load for 1 minute. Per TP-D350-748-2, these loads represent the maximum load on these crosstubes at gross weight and are below the yield point of the material. I would like to request that Chris Provencal witness these tests and sign off the work orders based on his experience with Dart landing gears. My feeling is that if there is a problem with the parts, it will manifest itself during this load test. I, for one, would feel a lot more confident in testing each crosstube in this manner than relying totally on what Exova has to say. I think it would be very difficult to reach a conclusion on the whole batch on the basis of cracks in two parts from the batch.

I believe that we can accomplish this before next Friday, which also gives us time to hear what Exova has to say in case it has an impact on our decision. So far, what I have seen from Exova shows me that there are fluctuations in the heat treating but the tubes are heat treated to our specification.

For this reason, I believe we should tell DHS that it looks like we will be able to start shipping 350 crosstubes by May 7th pending a successful Engineering test of the material.

David.

Work Order ID 77763

December-21-11 9:28:03 AM

77763

Page 5

Item ID: D350-748-101

Accept

N900040100

Setup Start

NS1

Revision ID: U/R

Item Name: Crosstube Installation, High Fwd

Stop

NS2

Start Date: 21/12/2011 Start Qty: 1.00

1

Cust Item ID:

Required Date: 13/01/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

180

0.00

180

SprayPaint

SprayPaint

Memo

0.00

Spray Painting

1-Prime inside crosstube as per QSI 005 4.2 **8120133 start 8:00 Finish: 8:45**

2-Prime Outside of Tube as per Dart QSI 005 4.2 **8121625 start 12:30 Finish 1:30**

~~2-Prime~~

AB

12-5-19

190

QC14- Inspect Spray Paint

0.00

190

QC

Memo

0.00

Quality Control

Then, Wrap in plastic bag to protect from scratches

AB

12.05.20

200

0.00

200

Crosstubes

Crosstubes

Memo

0.00

Crosstubes

1-Install Ground wire Insert, then insert screw and washer

2-Install Abrasion strips as per Dwg D350-748-141 & QSI 035.

3-Install supports Using Dt8876 as per Dwg D350-748-141, Torque to 60-80 IN-LBS

AB

12-5-20

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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Work Order ID 77763

December-21-11 9:28:03 AM

77763

Page 6

Item ID: D350-748-101 Accept ***N900040100*** Setup Start ***NS1***
 Revision ID: U/R Stop ***NS2***
 Item Name: Crosstube Installation, High Fwd
 Start Date: 21/12/2011 Start Qty: 1.00 ***1*** Cust Item ID:
 Required Date: 13/01/2012 Req'd Qty: 1.00 ***1*** Customer:
 Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
210 *210* QC Quality Control	QC5- Inspect part completeness to step on W/O Memo	0.00 0.00							
220 *220* Packaging Packaging	Pick Kit Memo	0.00 0.00				1			12/05/23 fb
230 *230* QC Quality Control	QC4- 100% Inspect kits for completeness Memo	0.00 0.00				1			12/05/23

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
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NOTE: Date & initial all entries

Work Order ID 77763

December-21-11 9:28:03 AM

77763

Page 7

Item ID: D350-748-101

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N900040100Setup Start ***NS1***

Revision ID: U/R

Stop ***NS2***

Item Name: Crosstube Installation, High Fwd

Start Date: 21/12/2011 Start Qty: 1.00

1

Cust Item ID:

Required Date: 13/01/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
240	Packaging	0.00							
240									
Packaging	Memo	0.00							
Packaging	Identify and pack for shipping as per PPP D350-748-101								
	Location: _____								
	PPP Rev: <u>C</u>								
250	QC21- Final Inspection - Work Order Release	0.00							
250									
QC	Memo	0.00							
Quality Control									

W 12/06/13

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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December-21-11 9:28:10 AM

77763

D350-748-101

Required Date: 13/01/2012

Required Qty: 1.00

Comments: IPP Rev:A New Issue 06-07-05 JLM
 IPP Rev:B Update qty of MS21042L5 06-09-12 KJ
 IPP Rev:C Rev B 07-11-15 DD
 IPP Rev D Combined manufacturing 08.04.02 EC verified by: DD
 IPP Rev:E 08-06-24 revD as per dwg DD verified by:EC IPP Rev:F
 10.08.04 added QSI010 4.3 DD verf:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D350-748-141TRN		Manufactured	No			110	Each	0.0000	1	1			
D350-748-141TRN													
Crosstube Turning Detail													
ALS4-1032-225		Purchased	No			200	Each	1,348.000	1	1			
AI S4-1032-225													
Insert													
				<u>Location</u>		<u>Loc Qty</u>		<u>Loc Code</u>					
				ST281		1348							
				108696		199							
				110768		62							
				118386		858							
				118966		229							
AN960JD10	NAS1149D0363J	Purchased	No			200	Each	0.0000	1	1			
AN960.ID10													
Washer													
D2856-400		Manufactured	No			200	f	200.2721	1.181	1.243158			
D2856-400													
Abraison Strip													
				<u>Location</u>		<u>Loc Qty</u>		<u>Loc Code</u>					
				ST409		200.2721							
				63735		0.6696							
				68076		0.3149							
				71164		21.66							
				73491		177.6276							

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Picklist Print

December-21-11 9:28:10 AM

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Parent Item: D350-748-101

D350-748-101

Parent Item Name: Crosstube Installation, High Fwd

Start Date: 21/12/2011

Required Date: 13/01/2012

Start Qty: 1.00

Required Qty: 1.00

D3502-1 Manufactured No

200

Each

23.0000

2

2

D3502-1

Support

**

AL 12-5-20

②

Location

Loc Qty

Loc Code

ST063

23

72129

3

73419

20

MS21920-20

Purchased

No

200

Each

60.0000

2

2

MS21920-20

Clamp (per MIL-DTL-8783C)

**

AL 12-5-20

②

Location

Loc Qty

Loc Code

LG050

60

116799

10

119386

50

MS27039-1-10

Purchased

No

200

Each

41.0000

1

1

MS27039-1-10

Screw

**

AL 12-5-20

①

Location

Loc Qty

Loc Code

~~ST291~~

41

51308

119307

3

119531

38

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Page 3

December-21-11 9:28:10 AM

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D350-748-101

Parent Item Name: Crosstube Installation, High Fwd

Start Date: 21/12/2011

Required Date: 13/01/2012

Start Qty: 1.00

Required Qty: 1.00

AN4-41A

Purchased

No

220

Each

285.0000

8

8

**

AN4-41A

Bolt

Location

Loc Qty

Loc Code

ST360

285

115108

3

115705

7

117619

50

117795

25

118451

50

118838

50

119328

100

3 X 117619

5 X 118451

AN4-6A

Purchased

No

220

Each

4,130.000

16

16

**

AN4-6A

Bolt

Location

Loc Qty

Loc Code

ST356

4130

119017

4130

AN5-32A

Purchased

No

220

Each

231.0000

4

4

**

AN5-32A

Bolt

Location

Loc Qty

Loc Code

ST339

231

118422

6

118628

50

118983

25

119328

100

119862

50

2 X 121416

2 X 120910

12/05/23

AN960JD416

NAS1149D0463J

Purchased

No

220

Each

0.0000

32

32

**

AN960JD416

Washer

25 X M121255 JB

7 X M121708

December-21-11 9:28:10 AM

Shop Packet Print

Page 3

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Picklist Print

Page 4

December-21-11 9:28:10 AM

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Parent Item: D350-748-101

D350-748-101

Parent Item Name: Crosstube Installation, High Fwd

Start Date: 21/12/2011

Required Date: 13/01/2012

Start Qty: 1.00

Required Qty: 1.00

AN960JD516 NAS1149D0563J Purchased No

220 Each 0.0000 8 8 ✓

AN960JD516

**

119546 JB

Washer

D3500-1 Manufactured No

220 Each 4.0000 4 4 ✓

D3500-1

**

76000 JB

Saddle

Location

Loc Qty

Loc Code

ST424

4

70695

4

D3501-1 Manufactured No

220 Each 396.0000 16 16 ✓

D3501-1

**

JB

Bushing

Location

Loc Qty

Loc Code

ST063

396

67757

4

70682

100

73391

85

74866

207

MS21042L4 Purchased No

220 Each 9,077.000 24 24 ✓

MS21042L4

**

121011 JB

Nut

Location

Loc Qty

Loc Code

ST300

9077

117441

51

117601

342

118451

133

119017

3551

119075

5000

December-21-11 9:28:11 AM

Shop Packet Print

Page 4

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

Page 5

December-21-11 9:28:11 AM

Work Order ID: 77763

77763

Parent Item: D350-748-101

D350-748-101

Parent Item Name: Crosstube Installation, High Fwd

Start Date: 21/12/2011

Required Date: 13/01/2012

Start Qty: 1.00

Required Qty: 1.00

MS21042L5

Purchased

No

220

Each

2,130.000

4

4

✓

MS21042I 5

Nut

JB 12/05/23

Location

Loc Qty

Loc Code

ST300

2130

116105

5

116548

43

117611

52

118179

496

118910

34

119109

1500

119109



W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

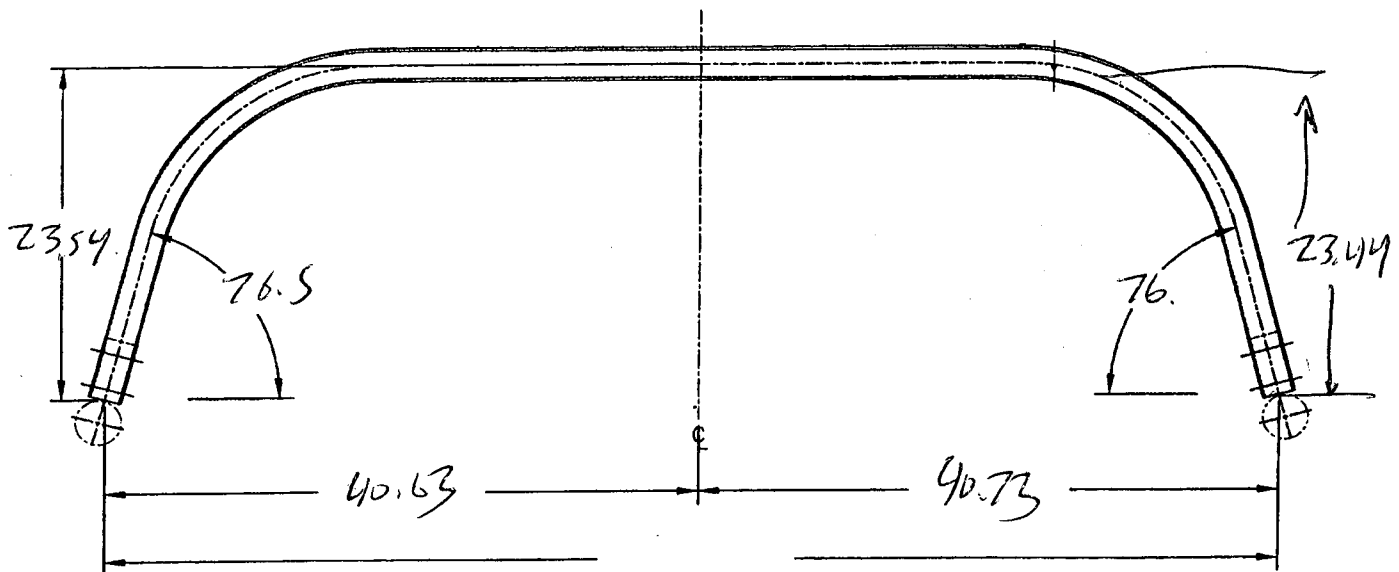
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD	Work Order: 77763.
Description: Crosstube High Fwd (AS350/355)	Part Number: D350-748-101
Inspection Dwg: D350-748-141 Rev: F	Page 1 of 1

Required Dimension	Min	Max
Height	23.13	23.37
1/2 Span	40.78	41.02
Angle	75	77
Total Span	81.56	82.04



Comments
Twist = 0.199
CRUSHING 4.4% / 4.4%

QC15 Inspection	CP
Date	12.04.11

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	10.08.23	Dwg Rev updated	KJ	
C	11.11.07	Dwg Rev updated	KJ	

2.612
2.266

2.607
2.259

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Item	Qty -141	Part Number	Description
1	X	D350-748-141	CROSSTUBE ASSEMBLY (AS 350/355 HI FWD)
2	1	D6015-125	CROSSTUBE (OR D6017-115)
3	2	D3502-1	SUPPORT
4	2	D2856-400-710	ABRASION STRIP
5	1	AELS-1032-225	INSERT
6	1	NAS1149D0363J	WASHER (OR AN960JD10)
7	2	MS21920-20	CLAMP (PER DART SPEC. M-MS21920-20)
8	1	MS27039-1-10	SCREW

GENERAL NOTES:

- MATERIAL: MANUFACTURED FROM D6015-125 OR D6017-115
FINISHED LENGTH = 110.270±0.06
- FINISH: MAGNETIC PARTICLE INSPECT PER DART QSI 038 4.2
CADMIUM PLATE PER AMS-QQ-P-416B, CLASS 1, TYPE II
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: DART PART NUMBER "D350-748-141" AND BATCH NUMBER ON INSIDE OF CUFF
PER DART QSI 044 6.4 (VIBRATING STYLUS)
- WEIGHT: 30.45 lbs
- PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR Ø0.297 HOLE.
- BLEND OUT ALL EDGES FROM MACHINING LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
NOTE: ALL HOLES ARE DRILLED AFTER BENDING.
- BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- HEAT TREAT TO MIN. 180 KSI PER MIL-T-6736 OR AMS 2759-1C AFTER TURNING. ACCEPTABLE TO VERIFY TENSILE STRENGTH BY HARDNESS TEST PER ASTM E18 TO 40-45 HRC.
- INSTALL D2856-400-710 ABRASION STRIPS WITH A GAP ON BOTTOM SIDE OF CROSSTUBE, CENTERED OPPOSITE D3502-1 SUPPORT, PER QSI 035.
- EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO CRACKING/CHIPPING/GROOVES.
- TORQUE CLAMPS 60 TO 80 IN.-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.
- MAX TWIST AFTER BENDING: WITH XTUBE LAYED FLAT ON SURFACE, THE DIFFERENCE BETWEEN CUFF HEIGHTS FROM THE SURFACE MAY BE NO LARGER THAN 0.25 (ZN C1-3).

F	ADD HRC TEST OPTION (B8-1) PER PAR 09-040, ADD TWIST LIMIT (A8-1, C1-3), ADD D6015-125 OPTION (C8-1), STOCK DIM NOW MACHINED (D1-4)	CP	10.11.23
E	REVISE GENERAL NOTES; UPDATE TO CURRENT ADD STANDARDS; RELOCATED FLAG #6 PER PAR 08-048 (ZN A6-3); TOLERANCES (ZN C8-3, D1-3)	RF	09.09.30
D	MAG. PARTICLE AND CAD PLATE AS MFD.	CP	06.10.31
C	ADD CAD PLATING	CP	06.08.14
B	ADD D6017-115 & PRIME AND PAINT	CP	06.06.30
A	NEW ISSUE	CP	06.03.31
REV.	DESCRIPTION	BY	DATE
DESIGN			
DRAWN			
CHECKED			
MFG. APPR.			
APPROVED			
DE APPR.			
DATE	10.11.23		

DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWING NO. D350-748-141	REV. F SHEET 1 OF 4
TITLE CROSSTUBE (AS 350/355 HI FWD)	SCALE NTS
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UNDER REVIEW

RELEASED
2011-01-18

77763 M.C.J
11/12/21

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

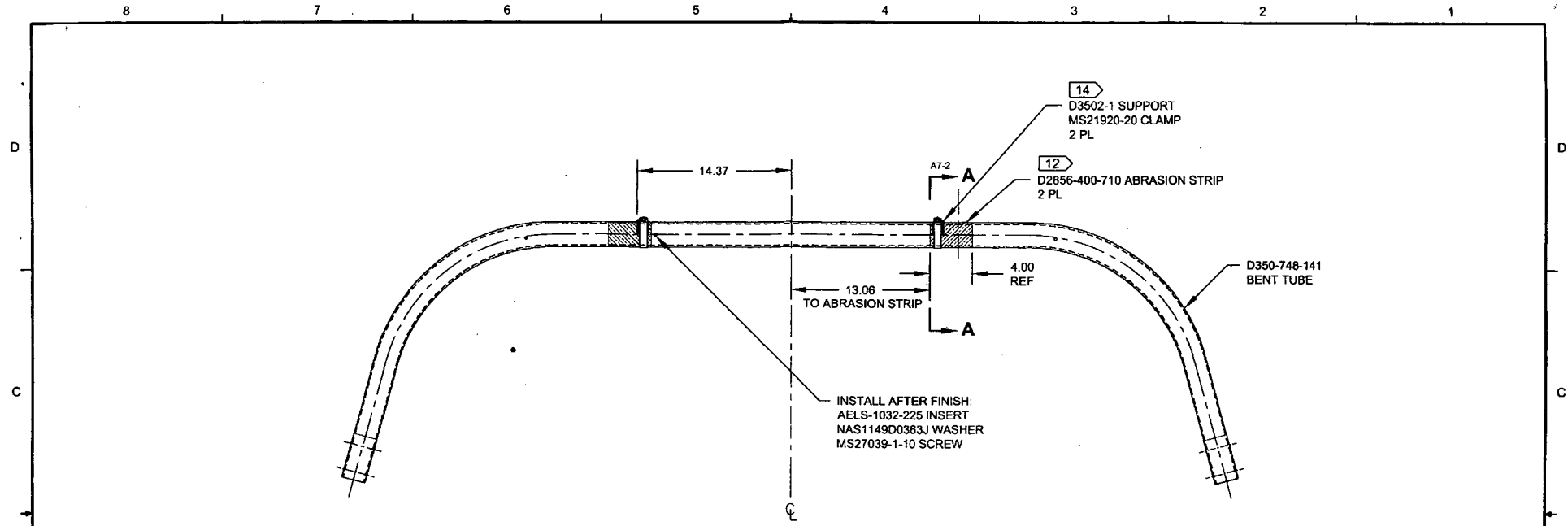
Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

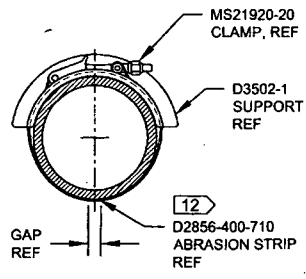
77763



**D350-748-141
ASSEMBLY DETAIL**

UNDER REVIEW
11.07.11

RELEASED
2011-01-28



SECTION A-A D4-2
SCALE 4X

DESIGN	97	DART AEROSPACE LTD	
DRAWN	97	HAWKESBURY, ONTARIO, CANADA	
CHECKED	97	DRAWING NO.	REV. F
MFG. APPR.	13	D350-748-141	SHEET 2 OF 4
APPROVED	13	TITLE	SCALE
DE APPR.	13	CROSSTUBE (AS 350/355 HI FWD)	NTS
DATE	10.11.23	<small>COPYRIGHT © 2006 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

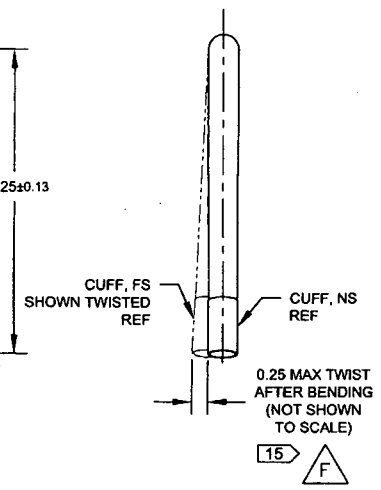
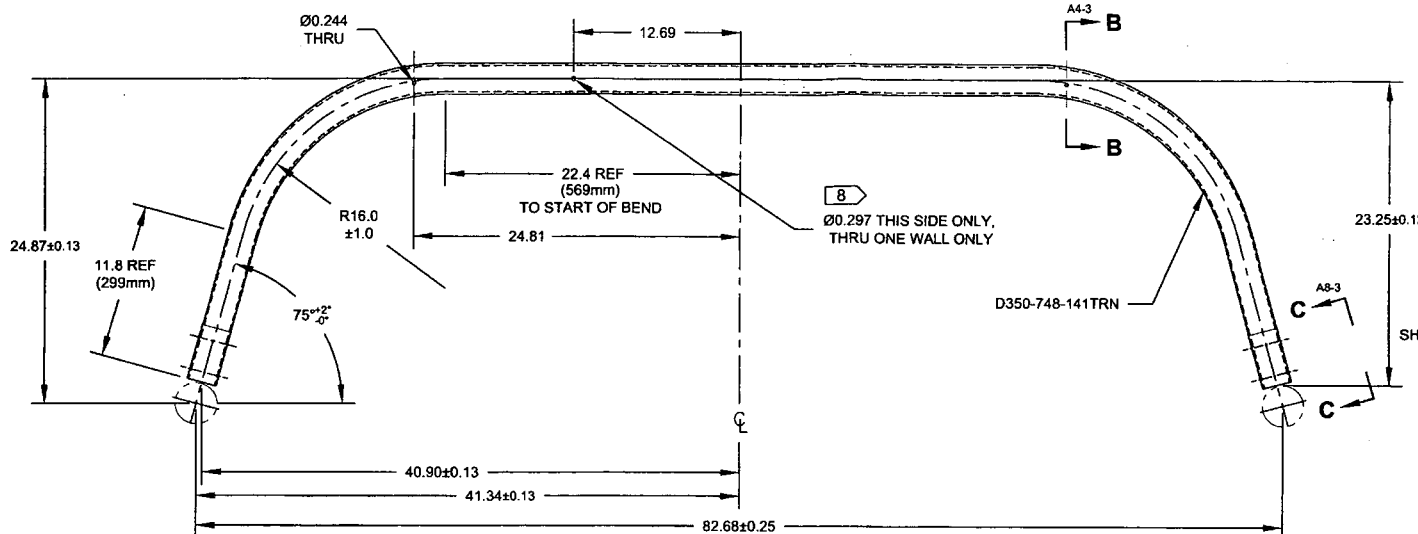
Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

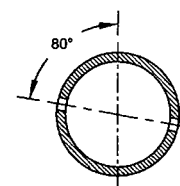
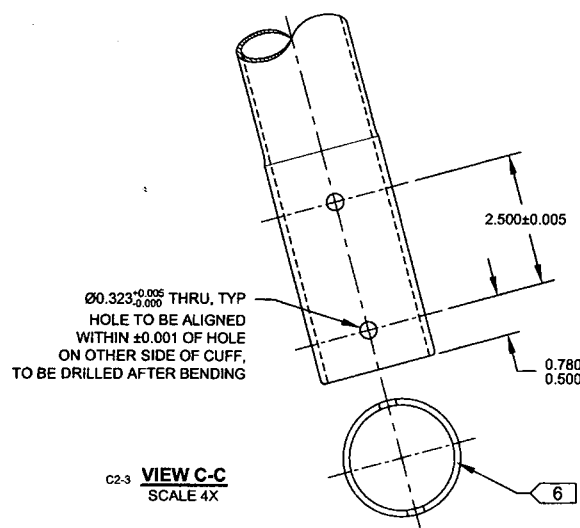
NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

77763



D350-748-141
BENDING AND DRILLING DETAIL 10



SECTION B-B D3-3
SCALE 4X

UNDER REVIEW
11.27.12

RELEASED
2011-01-18

DESIGN	90	DART AEROSPACE LTD	
DRAWN	90	HAWKESBURY, ONTARIO, CANADA	
CHECKED	90	DRAWING NO.	REV. F
MFG. APPR.	90	D350-748-141	SHEET 3 OF 4
APPROVED	90	TITLE	SCALE
DE APPR.	90	CROSSTUBE (AS 350/355 HI FWD)	NTS
DATE	10.11.23	COPYRIGHT © 2006 BY DART AEROSPACE LTD	
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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

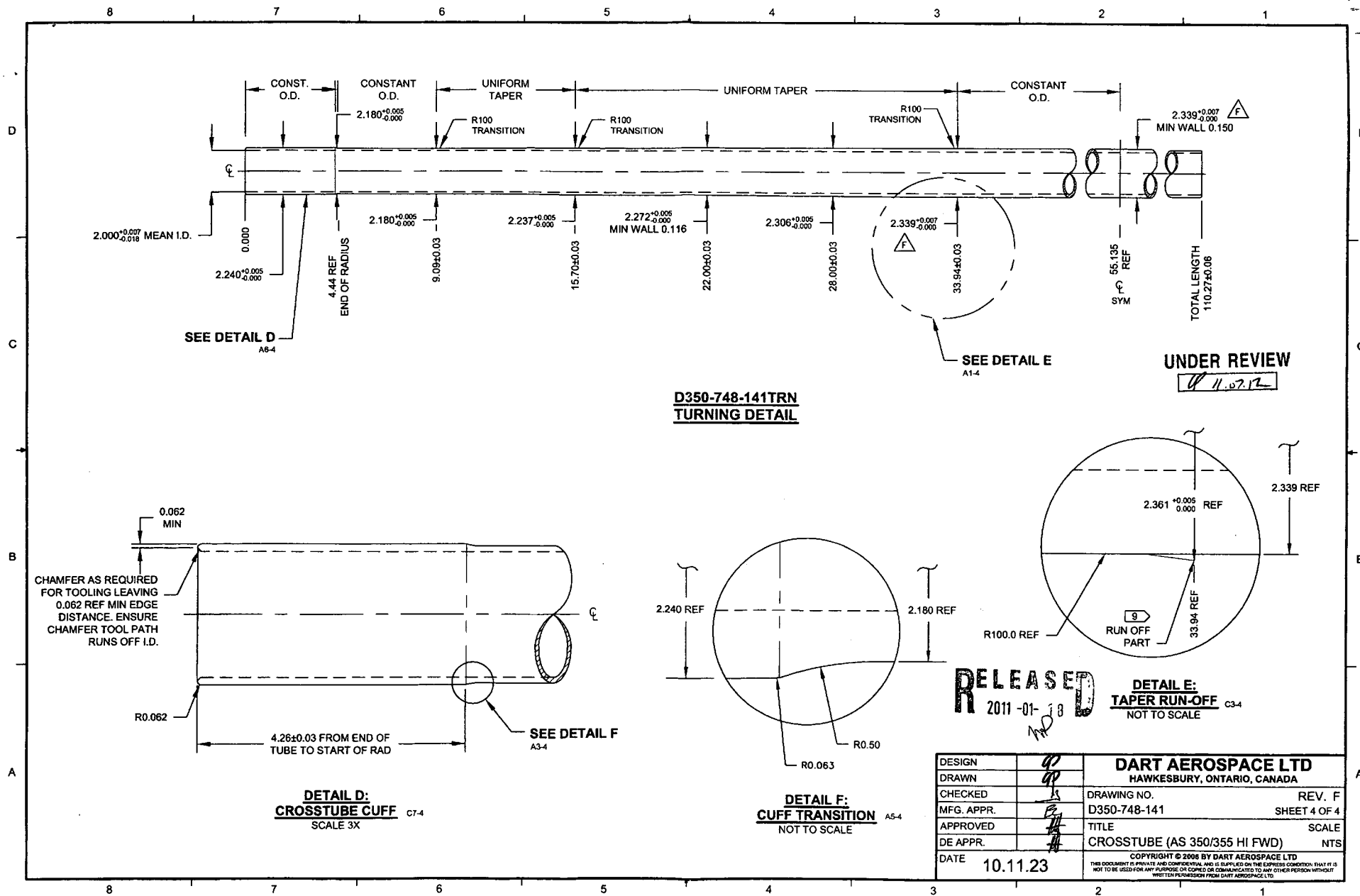
Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

77763



W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DRAWING NO. D350-748-141	TITLE CROSSTUBE (AS 350/355 HI FWD)	REV. F	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D350-748-141-F-1	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>JP</i>	CHECKED <i>JP</i>	MFG. APPR. <i>JP</i>	APPROVED <i>JP</i>		DE APPR. <i>JP</i>		
DATE 12.04.02	DATE 12.04.03	DATE 12.04.03	DATE 12.04.03		DATE 12.04.03		

PURPOSE:

ADD A STRESS RELIEF OPERATION FOLLOWING BENDING

CHANGE:

ADD

10) AFTER BENDING: STRESS RELIEF AT 650°F ± 25°F FOR A MINIMUM OF 2 HRS.
AIR COOL TO AMBIENT TEMPERATURE
(REF. AMS2759/1E)

METCOR INC.

560 BOUL. ARTHUR-SAUVÉ
ST-EUSTACHE, QC, J7R 5A8

Tel: 450-473-1884 / Fax: 450-491-5498

Certificat de Conformité Détaillé

Detailed Certificate of Compliance

BON DE TRAVAIL order	CHARGEMENT load
175005	1

CLIENT / customer 215

DART AEROSPACE
1270 ABERDEEN
HAWKESBURY

ON K6A 1K7

LIVRÉ À / shipped to:

DART AEROSPACE
1270 ABERDEEN
HAWKESBURY

ON K6A 1K7

1

COMMANDE DU CLIENT customer po	BON DE LIVRAISON DU CLIENT customer shipper no.	MATÉRIEL material	CODE DE TRAITEMENT mat'l heat code	NUMÉRO DE LOT lot number						
PO16638		Steel								
SPÉCIFICATIONS DU PROCÉDÉ processing specifications										
STRESS REL										
SAE AMS 2759/1 REV.E										
EXIGENCE / requirement SPÉCIFICATIONS / specified TESTS EXÉCUTÉS / performed RÉSULTATS DE TESTS / results										
Visual										
QUANTITÉ quantity	POIDS weight	DESCRIPTION DES PIÈCES parts description								
9	270	D350-748-101 (7) CROSS TUBE (2) D350-748-201 CROSS TUBE CONTENANT: 1 NIL								
Operation	Temp. spécifiée Specified Temp	Temps de trempage Spécifié Specified Soak Temp	Atmosphère	Carbone Carbon Potential	Q-Media Q-Temp	Four # Furnace #	Date Départ Start Date	Heure d'entrée Time In	Heure de sortie Time Out	Date Complétée Date complete
1,00 CONT. INIT.	LAVAGE		si nécessaire							
2,00 PREPARINC	COMPTAGE									
3,00 STRESS RE	650 +/-25°F	2 hrs	air			701				
4,00 FINAL INSP							04-05-2012			04-05-2012

COMMENTAIRES / comments

ALL THE HEAT TREATMENT PROCESSING PERFORMED ON THIS ORDER WAS ACCOMPLISHED USING HEAT TREATMENT EQUIPEMENT THAT MEETS THE REQUIREMENTS OF AMS 2759. ALL THE HEAT TREATMENT OPERATIONS WERE ACCOMPLISHED IN ACCORDANCE WITH THE REQUESTED/REQUIRED HEAT TREATMENT SPECIFICATION AND ALL REQUIRED VERIFICATIONS TEST HAVE BEEN PERFORMED AND DOCUMENTED. NO UNAUTHORIZED CHANGES OR DEVIATIONS TO REQUIRED HEAT TREATMENT SPECIFICATIONS OR PROCEDURES HAVE BEEN PERFORMED.



Metcor Inc.
560, boul. Arthur-Sauvé
St-Eustache (Québec) J7R 5A8
Tél: 450-491-5498
Télécopieur/Fax administration: 450-491-6454

Certificat de conformité Certificate of conformity	
BON DE TRAVAIL order	CHARGEMENT load
175005	1

CLIENT / customer 216
DART AEROSPACE
1270 ABERDEEN
HAWKESBURY ON K6A 1K7

LIVRÉ À / shipped to:
DART AEROSPACE
1270 ABERDEEN
HAWKESBURY ON K6A 1K7

COMMANDE DU CLIENT customer po	BON DE LIVRAISON DU CLIENT customer shipper no.	MATÉRIEL material	CODE DE TRAITEMENT mat'l heat code	NUMÉRO DE LOT lot number
		Steel		

SPECIFICATIONS DU PROCÉDÉ
processing specifications

STRESS REL

SAB AMS 2733A REV.E

EXIGENCE / requirement SPÉCIFICATIONS / specified TESTS EXÉCUTÉS / performed RÉSULTATS DE TESTS / results
Visual

QUANTITÉ quantity	POIDS weight	DESCRIPTION DES PIÈCES parts description
5	270	D350-748-141-F-1

COMMENTAIRES / comments

INSPECTEUR / inspector:

Small

DATE: 2012-04-05

Dora Cameron

From: Dan Stow <dstow@dartaero.com>
Sent: April 18, 2012 4:42 PM
To: Dora Cameron
Subject: FW: 350 crosstubes oval cuffs




Dan Stow

Special Projects Manager

T. 613-632-5200 | C. 613-676-3320 | F. 613-632-1426

1270 Aberdeen Street, Hawkesbury, Ontario, Canada, K6A 2K7

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From: David Shepherd [<mailto:dshepherd@dartaero.com>]
Sent: Wednesday, April 18, 2012 12:10 PM
To: 'Bill Beckett'
Cc: 'Dan Stow'; 'L Lacelle'; 'Mike Petsche'; 'Eric Downing'; 'Pat Smith'
Subject: RE: 350 crosstubes oval cuffs

Agreed ... This seems OK to me ... Hopefully we only need to do this to a handful of crosstubes.

David

From: Bill Beckett [<mailto:bbeckett@dartaero.com>]
Sent: April-18-12 6:31 AM
To: 'David Shepherd'
Cc: 'Dan Stow'; 'L Lacelle'; 'Mike Petsche'; 'Eric Downing'; Pat Smith
Subject: RE: 350 crosstubes oval cuffs

David,

This looks like a relatively controllable process that we could have Dan carry out on the other crosstubes that are oval in the cuff area.

If you agree with this rework method, we will proceed with the remainder of the crosstubes. I suggest we do this via markup on the specific work orders.

Bill

From: Dan Stow [<mailto:dstow@dartaero.com>]
Sent: April 18, 2012 7:52 AM
To: Bill Beckett; David Shepherd; 'Mike Petsche'; L Lacelle; Eric Downing
Subject: 350 crosstubes oval cuffs

Hello All,

Please reference photo attached. The crosstube was placed in a hydraulic press between two sheets of plywood to prevent damage with the max. dimension facing up and down. 9000 lbs (5000psi at 1.5" bore) was applied and then crosstube was removed from the press and measured. Process was repeated with the crosstube at a different position because the max. dimension had changed location. Total time for rework was approximately 20 mins.

Cuff dimension before rework was min. 2.200" max. 2.280"

Cuff dimension after rework is min.2.230" max. 2.252" which is 0.010" below tolerance and 0.007" above tolerance but now fits in the drill jig.



Dan Stow

Special Projects Manager

T. 613-632-5200 | C. 613-676-3320 | F. 613-632-1426

1270 Aberdeen Street, Hawkesbury, Ontario, Canada, K6A 2K7

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Packing Slip



Cadorth Coating

2150 Logan Avenue, Winnipeg, Manitoba R2R-0J2

Phone: (204) 633-9420 Fax: (204) 633-8033

INVOICE NUMBER:

60271

Sold To:

Dart Aerospace Ltd.
1270 Aberdeen St.

Hawksbury, ON K6A 1K7

Ship To:

Net 2% Interest Per Month charged on Overdue Accounts.
Any claims for shortages, overcharges, or damaged goods must
be made within seven (7) days from receipt of goods.

Customer Order #: PO16826
Date Received: May-01-2012

Terms: NET 30 DAYS

G.S.T. #: 10071 6547 RT0001

Ship Via:

Ship Date: May-03-2012

Item # Qty P/N & Description

1 1 EA SKID
P/N d350-748-201

S/N B73807
W/O 114047

2 1 EA SKID
P/N d350-748-101

S/N B77763
W/O 114042

**CERTIFICATE OF
CONFORMANCE**

**CADORATH PLATING CO. LTD.
2150 LOGAN AVENUE
WINNIPEG, MANITOBA R2J-0J1**

DATE: May-03-2012

CONSIGNED TO: Dart Aerospace Ltd.
1270 Aberdeen St.
Hawksbury, ON K6A 1K7

W/O #: 114042
INVOICE #: 60271

**CONTRACT OR
PURCHASE ORDER #** PO16826

DESCRIPTION: SKID

QTY 1

P/N # d350-748-101

S/N # B77763

MPI IAW ASTM-E-1444. CADMIUM PLATE IAW AMS-QQ-P-416C TYPE
2 YELLOW CLASS 1. BAKE HEAT CHART # 12-425 AND # 12-442.

CERTIFICATE: I certify that the items indicated here on have
been inspected and tested and conform to all specifications
and requirements detailed on the contract or purchase order.

Approved Inspector:





RAPPORT D'INSPECTION PAR RESSUAGE

P - 11201

PAGE 1 DE 2
HEURE AM ☐ PM ☒

CLIENT
ATTENTION
DRESSER

Client Aerospace
Mme Charbel
1270 Aberdeen St
Hawkesbury, ONT

DATE
N° TRAVAIL
ACUREN
N° CLIENT PO/WO
SITE DE TRAVAIL
ACCEPTATION STD.

May 17th 2012
188-12-2012
30551
Hawkesbury
1544 E.H. 705
31-238

DATE/RÉV. 2009

PROJET
ITEM(S) EXAMINÉ

Inspection Fluorescent on exoskeleton external surface
9 Cessna

DESCRIPTION DES TRAVAUX	N° PROCÉDURE	LT 002	DATE/RÉV.	2009	N° TECHNIQUE	LT 002	DATE/RÉV.	2009
ITEMS	9 Cessna see below							
DESCRIPTION	Fluorescent inspection, 100% on external surface on 9 Cessna							

DÉTAILS DES INSPECTIONS			
MÉTHODE:	<input type="checkbox"/> FLUORESCENT	<input type="checkbox"/> VISIBLE	<input checked="" type="checkbox"/> LAVABLE À L'EAU
MARQUE:	Magnaflux		
PÉNÉTRANT:	Sagb 21-67		
DISSOLVANT PÉNÉTRANT:	220		
RÉVÉLATEUR	SND 5-2		
TYPE RÉVÉLATEUR	<input type="checkbox"/> NON AQUEUX	<input type="checkbox"/> AQUEUX	<input type="checkbox"/> SEC
SURFACE INSPECTÉE			
CONDITION SURFACE	<input type="checkbox"/> MEULÉE	<input type="checkbox"/> SOUDÉE	<input checked="" type="checkbox"/> MACHINÉE
TEMPÉRATURE SURFACE	<input type="checkbox"/> < -4°C/20°F	<input type="checkbox"/> -4°C/20°F DE 10°C/50°F	<input checked="" type="checkbox"/> 10°C/50°F DE 52°C/125°F
RÉSULTATS-	<input type="checkbox"/> MÉTRIQUE <input type="checkbox"/> IMPÉRIAL		

See other sheet
for result

P/b 17031

MW

Étendue des Services
L'entente selon laquelle le Groupe Acuren Inc. exécute les services ne concerne que les énoncés par écrit. En aucune circonstance ces services ne s'étendent au-delà de l'exécution des services demandés. Il est entendu que toutes les descriptions, les observations et les expressions d'opinions faites par Acuren reflètent les opinions ou les observations de l'entreprise fondées sur l'information et les hypothèses fournies par le propriétaire/opérateur, et elles ne constituent pas des déclarations ou des garanties ou ne peuvent être interprétées comme constituant. Le Groupe Acuren Inc. n'assume aucune des responsabilités du propriétaire/opérateur, et le propriétaire/opérateur conserve la responsabilité entière des décisions prises en matière d'ingénierie, de fabrication, de réparation et d'usage à partir de l'information ou des données fournies par Acuren en rapport avec les services décrits dans les présentes ne peuvent excéder le coût des services rendus.

Norme de Diligence Dans l'exécution des services, le Groupe Acuren Inc. applique le degré de diligence, le soin et la compétence normalement exercés dans des circonstances semblables par d'autres fournisseurs de ce type de services opérant dans la même localité ou dans une localité similaire. Aucune autre garantie, implicite ou explicite, n'est faite ou voulue par le Groupe Acuren Inc.	
SIGNATURES	FTJ #
REPRÉSENTANT	RAPPORT
TECHNICIEN (SIGNATURE)	RÉVISÉ PAR:
NOM (MOULÉ):	NOM
1 ^{ER} TECHNICIEN	INITIALES
2 ^{ME} TECHNICIEN	
ONGC NIVEAU	ONGC NIVEAU
ONGC N° REG.	ONGC N° REG.



RAPPORT D'ESSAI NON DESTRUCTIF

(SUITE)

RAPPORT #

P-11201

PAGE 2 DE 2

CLIENT	Dart Aerospace	DATE	May 17, 2012	HEURE	<input type="checkbox"/> AM <input checked="" type="checkbox"/> PM
ATTENTION		NO. TRAVAIL ACUREN	188-12-2012		
RÉSULTATS	<input type="checkbox"/> METRIQUE <input type="checkbox"/> IMPÉRIAL				

	work order	ID	Crosstubes	Item ID	D350-748-101	Inspection
1	"	"	83060	"	"	OK
2	"	"	77766	"	"	OK
3	"	"	76574	"	"	OK
4	"	"	81518	"	"	OK
5	"	"	76573	"	"	OK
6	"	"	77763	"	"	OK
7	"	"	73807	"	"	201 OK
8	"	"	81523	"	"	201 OK

on crosstube B 83060

2 x-tubes under
batch # 83060
→ Preliminary Design

No paper work
Fit with this
number
Inspection OK

Étendue des Services

L'entente selon laquelle le Groupe Acuren Inc. exécute les services décrits, les observations et les expressions d'opinions faites ne pas des déclarations ou des garanties ou ne peuvent être interprétées des décisions prises en matière d'ingénierie, de fabrication, services rendus.

Norme de Diligence

Dans l'exécution des services, le Groupe Acuren Inc. applique le de localité ou dans une localité similaire. Aucune autre garantie, implicite ou explicite.

SIGNATURES

REPRÉSENTANT
À LA CLIENTÈLE

TECHNICIEN (SIGNATURE)

NAME (MOULÉE):

NIVEAU CGSB

NIVEAU SNT

No. ENREG. CGSB

NIVEAU CGSB

No. ENREG. CGSB

SIGNATURE

2^e TECHNICIEN

NIVEAU SNT

FTJ #:

RAPPORT
REVISÉ PAR:

NOM

INITIALES

P-3050

BLANCHE - COPIE DU CLIENT

JAUNE - COPIE DU BUREAU

ROSE - COPIE DU TECHNICIEN

OR - COPIE DU BUREAU

Work Order ID 79012

79012

Page 1

June-13-12 8:03:10 AM

Item ID: D350-748-141TRN Accept ***N900040100*** Setup Start ***NS1***
 Revision ID: U/R Stop ***NS2***
 Item Name: Crosstube Turning Detail
 Start Date: 1/18/12 Start Qty: 1.00 ***1*** Cust Item ID:
 Required Date: 1/20/12 Req'd Qty: 1.00 ***1*** Customer:

Reference:

Approvals: Process Plan: W Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr	Revision Nbr
D350-748-141	F U/R

100 0.00

100

Mori Seiki
Mori Seiki CNC Lathe Large

MORI SEIKI CNC LATHE LARGE

Memo

0.00
 1-Fill tube with sand & install plugs on both ends as per Folio FA648
 2-Turn first side as per Folio FA648
 3- File transition lines smooth.
 FOLIO REV: _____
 DWG REV: _____

110

QC1- Inspect dimensions to dimension sheet

0.00

110

QC
Quality Control

Memo

0.00

*See 2/1/12
 w/o burnt in fine
 u 1206013*

June-13-12 8:03:10 AM

Page 2

Setup Start *NS1*

Stop *NS2*

Reference:

Run Start *NR1*

Stop *NR2*

120	0.00
-----	------

0.00

0.00

1-Turn second side as per Folio FA648
2- File transition lines smooth.
3-Scribe Part & Batch as per Dwg D350-748-141
FOLIO REV: _____
DWG REV: _____

QC1- Inspect dimensions to dimension sheet	0.00
--	------

Memo

0.00

Quality Control

QC8- Inspect parts - second check	0.00
-----------------------------------	------

Memo

0.00

Quality Control

79012

June-13-12 8:03:10 AM

N900040100

Setup Start *NS1*

Stop *NS2*

Start Date: 1/18/12 **Start Qty:** 1.00 ***1***

Cust Item ID:

Required Date: 1/20/12 **Req'd Qty:** 1.00 *** 1 ***

Customer:

Reference:

Run Start *NR1*

Approvals: **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____

Stop *NR2*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

180

QC6- Inspect dimensions to drawing

0.00

180

QC

Memo

0.00

Quality Control

190

0.00

190

Packaging

Packaging

Memo

0.00

Packaging

Identify and stock in kanban rack
Location:

200

QC21- Final Inspection - Work Order Release

0.00

200

QC

Memo

0.00

Quality Control

LOT TRACKING !!

Parent Item ID	Reason	Lot Qty	Lot Nbr	Lot Trans Date
D6015-125	79012	-1	72511	1/31/12 11:50:56 AM

Work Order Summary

June-08-12 10:58:16 AM

Page 1 of 2

Criteria : Work Order ID: 79012 Item ID: D350-748-141TRN Product Family CROSSTUBES
 Work Order Start Dates 1/18/12 to 1/18/12 11:59:59 PM Work Order Required Dates 1/20/12 to 1/20/12
 11:59:59 PM

All References
 Work Order Status Released

Work Order ID	79012	Required Qty	1.0000	Status Code	Released
Item ID	D350-748-141TRN	Accepted Qty	0.0000	Scrap Qty	0.0000
Item Name	Crosstube Turning Detail				
Current Acct Value	\$809.571				

Start Date	1/18/12	Required Date	1/20/12	Completed Date	
Standard	** Actual **		** Acct. Value **	** Variance **	** Variance % **
Direct Costs	Total	Each	Each	Each	Each
Material	\$158.000	\$0.000	\$157.891	\$157.891	100.00%
Labor	\$121.509	\$0.000	\$113.433	\$113.433	100.00%
Outplant	\$205.000	\$0.000	\$175.000	\$175.000	100.00%
Variable Burden	\$0.000	\$0.000	\$0.001	\$0.001	100.00%
Fixed Burden	\$305.451	\$0.000	\$285.148	\$285.148	100.00%
Material Burden	\$0.000	\$0.000	\$0.000	\$0.000	0.00%
** Total **	\$789.960	\$0.000	\$731.474	\$731.474	

Item ID/Item Name	Required Qty	Issue Code	Issue Date	Issued Qty	Cost Amount
PO-ID	PO-Line Nbr	PO Receiver Date	Domestic Unit	PO Receipt Qty	Domestic Certification Standard
D6015-125			Price	Received Amt	
Crosstube Material		PO Vendor ID	VU-MET001		
PO Rout Seq ID		1.0000		1/31/12	1.0000
PO16353	1	4/05/12 1:33:17 PM	\$205.0000	1.0000	\$205.000
				121292	
				Total Matl Amts:	\$158.005

Invoice Rout Seq ID Invoice Vendor ID VU-MET001

Invoice ID	Invoice Line Nbr	Invoice Date	Invoice Unit Price	Invoice Qty	Invoice Amt
0112517	1	4/02/12 11:52:59 AM	225.5	1.0000	\$225.500

Work Center Crosstubes

Employee ID	Rout Seq ID	Labor Date	Setup Hours	Actual Setup Hours	Labor Hours	Actual Labor Hours	Nbr of WOs	Setup Amount	Labor Amount	Fix Burd Amount	Var Burd Amount	Total Amounts
MOUS01	2/09/12											
150			0.00	0.00	2.69	2.69	1.00	\$0.000	\$50.568	\$127.117	\$0.000	\$177.68
Total:			0.00	0.00	2.69	2.69	1.00	\$0.000	\$50.568	\$127.117	\$0.000	\$177.68

Work Center Mori Seiki

Employee ID	Rout Seq ID	Labor Date	Setup Hours	Actual Setup Hours	Labor Hours	Actual Labor Hours	Nbr of WOs	Setup Amount	Labor Amount	Fix Burd Amount	Var Burd Amount	Total Amounts
LACO01												

LACO01

June-08-12 10:58:16 AM

Work Order Summary

Page 1 of 2

1/31/12											
100		0.14	0.14	0.00	0.00	1.00	\$2.667	\$0.000	\$6.704	\$0.000	\$9.37
100		0.00	0.00	1.12	1.12	1.00	\$0.000	\$21.020	\$52.841	\$0.000	\$73.86
2/01/12											
120		0.00	0.00	2.51	2.51	1.00	\$0.000	\$47.253	\$118.786	\$0.000	\$166.03
Total:		0.14	0.14	3.63	3.63	3.00	\$2.667	\$68.273	\$178.330	\$0.000	\$249.27